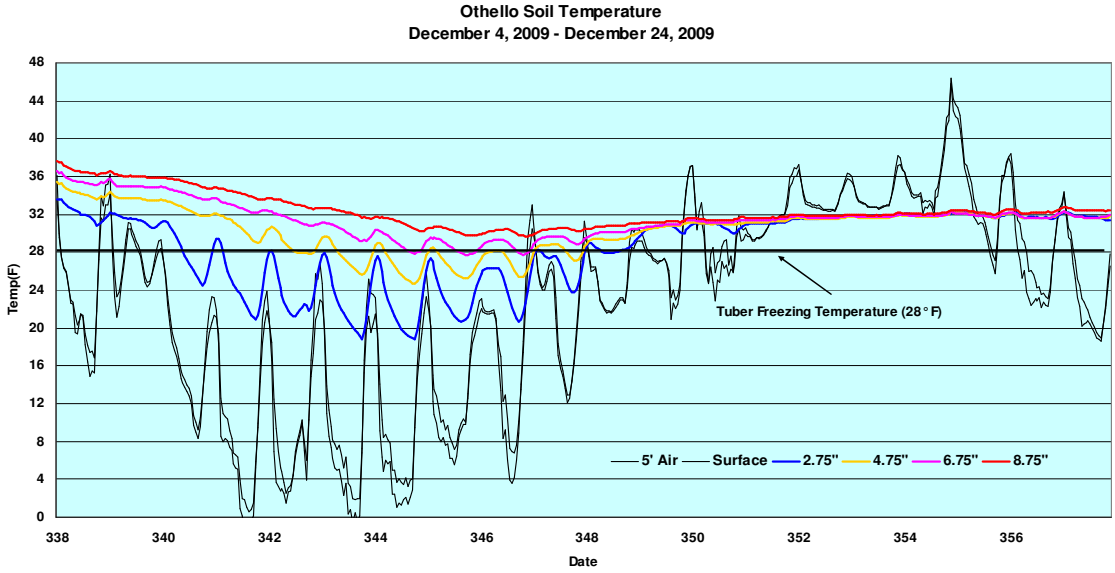
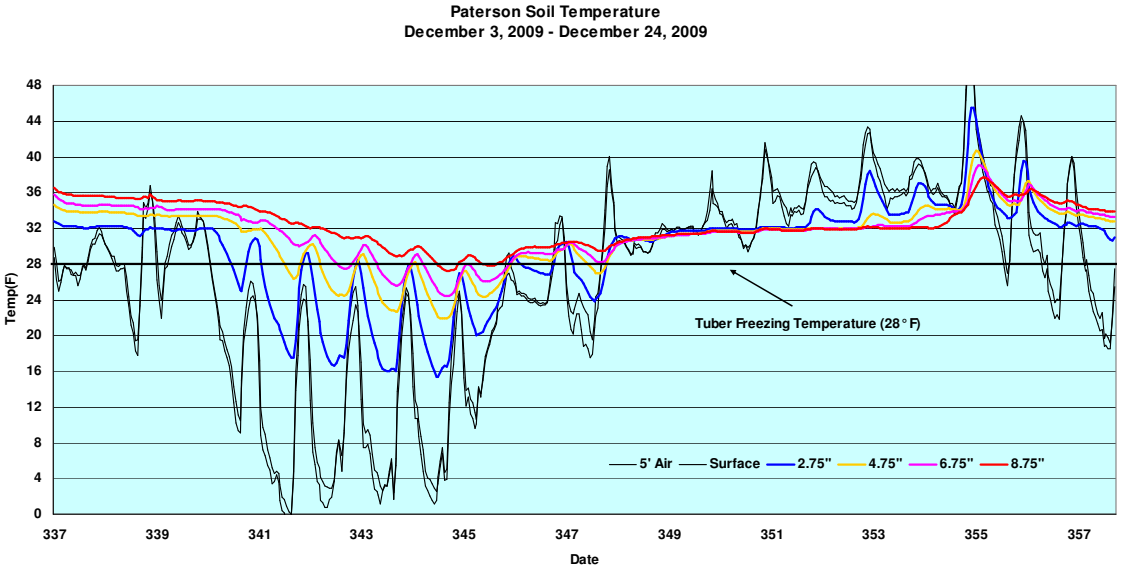
Volunteer Potato Outlook - 2010

Rick Boydston and Marc Seymour, USDA-ARS, Prosser.

Winter soil temperatures recorded at the USDA-ARS research site near Paterson, WA indicate that soil temperatures of 24.5^0 F on December 10 killed tubers above 8 3/4 inches deep. Potato tubers are normally killed when they reach temperatures ≤ 28° F. During the period December 8-11 soil temperatures at Othello were low enough to kill tubers above 7 inches deep. Data from the Agrimet weather station in Odessa, WA indicated that lowest soil temperatures this winter occurred on December 13 and tubers above 8 inches deep likely froze. The vast majority of potato tubers left in the field are in the upper 6 inches of the soil profile unless deep post-harvest tillage, such as mold board plowing was done.

From previous studies on tuber distribution by depth in the soil profile, we estimate 82% and 94% tuber death at Othello and Paterson, respectively. Based on soil temperatures recorded at these three sites, growers in the Columbia Basin will have relatively few volunteer potato problems in 2010. Volunteer potatoes that survive will be at deeper depths than normal and those potatoes that emerge in the spring will likely be somewhat delayed.





Recommendations for Volunteer Potato Control:

Growers should minimize the number of tubers left in the field during potato harvest (Steiner et al., EB1993). Newberry and Thornton (2004) demonstrated that deep fall tillage (mold board plow) that buries tubers deeper prior to cold winter temperatures should be avoided. Previous studies comparing tillage practices indicated that plowing **following** a deep penetrating frost could be beneficial by exposing deeper buried tubers to additional freezing events (Thomas and Smith, 1983). However, weather patterns are not always conducive to make this practice effective and field access in winter months is often limited.

Control measures should strive to minimize competition with rotational crops and formation of new daughter tubers that can persist and cause problems in subsequent crops. Several components of volunteer potato management that growers can implement in this year's rotational crops are listed below.

- On higher value crops with nematode problems such as carrot or onions, spring fumigate with metham sodium (Vapam, Busan, and others) and 1, 3,-dichloropropene (Telone II). Field studies indicate about 70 to 75% of tubers are killed by a combination of Telone II at 10 GPA applied with shanks plus Vapam at 30 GPA applied by center pivot. Lower rates of fumigants are less effective in killing tubers. Follow labels for proper rates, soil temperatures, soil moisture, and time required between fumigation and planting of subsequent crop.

- If possible, delay planting of the rotation crop to allow maximum early volunteer potato emergence and apply glyphosate (Roundup) or remove with tillage. If planting glyphosate resistant crops, wait to apply glyphosate until the majority of the volunteer potatoes have emerged and are just beginning to initiate tubers.
- Maleic hydrazide applied to the potato crop can significantly reduce volunteer potato sprouting the following year. Check with processor before using.
- Use herbicides that are active in reducing volunteer potatoes in rotation crops. Several herbicides can be very effective in killing potato plants and reducing daughter tuber weight, including mesotrione (Callisto), fluroxypyr (Starane), atrazine (Aatrex, Atrazine), glyphosate (Roundup), dicamba + diflufenzopyr (Distinct), dicamba (Banvel, Clarity), and imazamox (Raptor). Ethofumesate (Nortron) applied preemergence retards potato emergence and applied postemergence can reduce potato competition with the crop. Repeated applications of contact herbicides such as, oxyfluorfen (Goal), carfentrazone (Aim), fomesafen (Reflex), glufosinate (Rely), and paraquat (Gramoxone) can also be effective. Follow labels closely for labeled crops, proper rates, timing of applications, and crop rotation restrictions.
- When possible, apply postemergence herbicides when potatoes are just beginning to initiate tubers on stolons. If applications are made earlier, mother tubers often resprout and the volunteer plants will require additional herbicide applications. If applications are made later, yield loss may have already occurred and many new tubers will have already formed which will infest next year's crop.
- Previous USDA-ARS research demonstrated that cultivation about 1 week after postemergence applications of Starane, Goal, Roundup, and Banvel greatly reduced the number of daughter tubers formed compared to herbicides alone. In corn, Callisto herbicide has reduced new daughter tuber formation greater than other postemergence herbicides. Cultivation after Callisto application may not improve volunteer potato control.
- Select competitive crops and those with effective herbicide and cultivation options like field corn. Crops like carrots have few effective herbicides registered for volunteer potato control, so avoid planting such crops in fields where volunteers will be plentiful. Winter wheat is a very competitive crop and delays volunteer potato emergence in the spring. However, cultivation isn't practical in wheat and there are limited opportunities for timing effective herbicide applications in winter wheat prior to new tuber set on volunteer potatoes.
- Repeated cultivations and hand weeding can control volunteer potatoes, but they are most effective and economical when combined with other control methods.
- Grazing fields with hogs, sheep, or cattle may also reduce the number of tubers available to sprout.

For more detailed control information contact Rick Boydston, USDA-ARS, 24106 N Bunn Road, Prosser, WA 99350. Phone (509) 786-9267. Email: rick.boydston@ars.ars.usda.gov

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